

Amendments to the Claims:

Please cancel claims 33-35 without prejudice or disclaimer of the subject matter contained therein. This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1-12. Canceled

13. (Previously Presented) A method of etching a semiconductor device to form an etched pattern therein, comprising:

(a) providing a semiconductor device having a plurality of layers, at least one of the layers of the semiconductor device comprising an unetched refractory metal-containing material;

(b) etching the unetched refractory metal-containing material layer of the semiconductor device with a first etchant chemistry which comprises a chlorine source free of BCl_3 and a fluorine source; followed with

(c) etching the semiconductor device with a second etchant chemistry which is free of fluorine,

wherein etching comprises etching the semiconductor device with a source power of from about 100 watts to about 450 watts and a bias power of from about 200 watts to about 500 watts.

14. (Original) The method of Claim 13, wherein the ratio of the bias power to the source power is about 0.5:5.

15. (Previously Presented) A method of etching an unetched refractory metal-containing layer and an oxide layer, the method comprising:

(a) etching the unetched refractory metal-containing layer to an end point using a first etchant chemistry at a source power of from about 100 watts to about 450 watts and

a bias power of from about 200 watts to about 500 watts, wherein the first etchant chemistry comprises a chlorine source free of BCl_3 and a fluorine source; and

(b) etching partially through the oxide layer using a second etchant chemistry, wherein the second etchant chemistry comprises a chlorine source, and contains no fluorine.

16. (Previously Presented) The method of Claim 15, wherein the unetched refractory metal-containing layer is disposed above the oxide layer.

17. (Previously Presented) The method of Claim 15, wherein the unetched refractory metal-containing layer comprises a material selected from the group consisting of refractory metals, refractory metal alloys and refractory metal silicides.

18. (Previously Presented) The method of Claim 17, wherein the unetched refractory metal-containing material comprises a refractory metal selected from the group consisting of molybdenum, titanium and tungsten or a refractory metal silicide selected from the group consisting of tungsten silicide and molybdenum silicide.

19. (Previously Presented) The method of Claim 17, wherein the unetched refractory metal-containing material comprises TiW alloy.

20. (Original) The method of Claim 15, wherein the chlorine source of the first etchant chemistry is selected from the group consisting of Cl_2 , HCl and CCl_4 .

21. (Original) The method of Claim 15, wherein the fluorine source of the first etchant chemistry is selected from the group consisting of SF_6 , F_2 , NF_3 and CF_4 .

22. (Original) The method of Claim 15, wherein the first etchant chemistry has a chlorine concentration of about 50 percent to about 95 percent.

23. (Original) The method of Claim 15, wherein the first etchant chemistry further comprises N₂.

24. (Original) The method of Claim 15, wherein the chlorine source of the second etchant chemistry is selected from the group consisting of Cl₂, HCl and CCl₄.

25. (Original) The method of Claim 15, wherein the second etchant chemistry has a chlorine concentration of about 50 percent to about 95 percent.

26. (Original) The method of Claim 15, wherein the second etchant chemistry further comprises N₂.

27. (Original) The method of Claim 15, wherein the first etchant chemistry comprises about 45 sccm of Cl₂, about 30 sccm of SF₆ and about 5 sccm of N₂.

28. (Original) The method of Claim 15, wherein the second etchant chemistry comprises about 45 sccm of Cl₂ and about 15 sccm of N₂.

29. (Original) The method of Claim 15, wherein the source power is from about 125 watts to about 210 watts and the bias power is from 225 watts to about 310 watts.

30. (Original) The method of Claim 15, wherein the ratio of the bias power to the source power is about 0.5:5.

31. (Previously Presented) A method of etching a semiconductor device using a capacitive coupling plasma reactor to form a pattern on the semiconductor device, comprising:

(a) providing a semiconductor device having a plurality of layers, at least one of the layers of the semiconductor device comprising an unetched refractory metal-containing material; and

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(b) etching the unetched refractory metal-containing material of the semiconductor device at a bias power of from about 100 watts to about 750 watts, with a first etchant chemistry comprising chlorine free of BCl_3 and a fluorine source; followed with

(c) etching the semiconductor device with a second etchant chemistry free of fluorine.

32. (Original) The method of Claim 27, wherein the bias power is from about 250 watts to about 350 watts.

33.-35. Canceled